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LEAK DETECTION METHOD AND MICRO-MACHINED DEVICE ASSEMBLY

ABSTRACT OF THE DISCLOSURE

The present invention involves an electrical verification method that detects moisture within the cavity of the semiconductor or micro-machined device. The method affects an increase in the time for sufficient water vapor to remain within an unsealed device, so that instability in the diode can be measurable over a longer period of time. The method begins with the step of forming at least one reservoir on at least one of the device wafer and the capping wafer. The at least one reservoir connects to at least one diffusion channel, which is in communication with at least one reservoir port. The method further includes the steps of forming a PN junction diode adjacent to the at least one reservoir port; bonding the device wafer with the capping wafer to form a cavity; and electrically testing the PN junction diode as an indication of the presence of moisture within the cavity. The device assembly of the present invention includes a capping wafer bonded on a device wafer to form a cavity; at least one reservoir including at least one diffusion channel for receiving a liquid and retaining moisture. The at least one diffusion channel communicates with at least one reservoir port, which is open into the cavity. An exposed PN junction diode is provided adjacent to the at least one reservoir port, and a pair of metal pads is connected to the exposed PN junction diode.